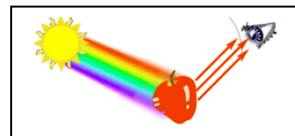


Activity #6



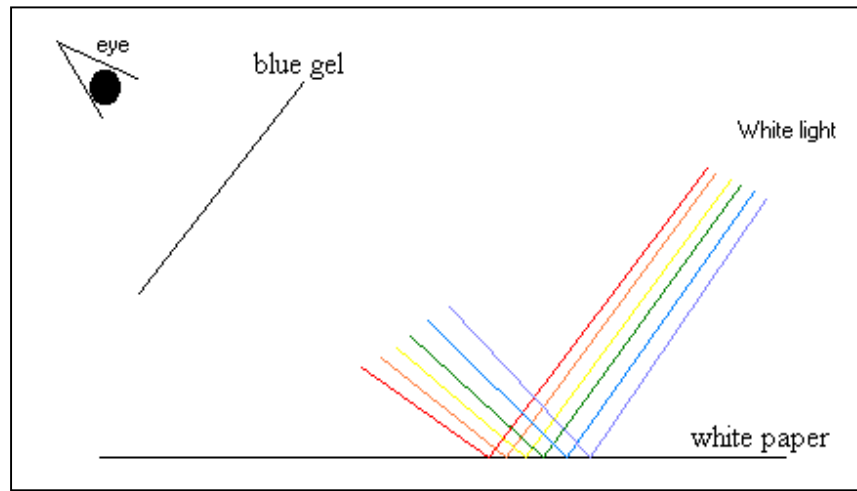
Title: Observing Colors-Student's Copy

Purpose: to investigate the appearance of several colored objects under different viewing conditions

Materials: 1 2" x 4" strip of black construction paper, 1 2" x 4" strip of red construction paper, 1 blank white paper, 1 red and 1 blue filter (gel) cut into 2" x 5" strip, 1 red crayon, 1 blue crayon (1 per team), (Internet access on a classroom computer is required for 1 segment of this activity.)

Procedure:

1. Illuminated by the classroom's overhead fluorescent lights, PREDICT what color the blank white paper, the blank red construction paper strip and the blank black construction paper strip will appear when viewed through the red and blue gels. Enter your "PREDICTION" on the accompanying answer sheet's Data Chart #1.
2. Now actually view the white, red, black papers through the gels and record your findings on the "OBSERVATION" lines of your data chart. (Note: When viewing, hold the sheet of white paper and the strips of colored paper overhead, so that the room lights are BEHIND the papers. This will reduce any reflected "glare" from the papers, which would lead to inaccurate observations.)
3. To help understand what you have just observed, respond to the following questions on your answer sheet:
 - a. Is there any red light reflecting from the white paper?
 - b. How do you know?
 - c. Is there any red light reflecting from the red paper?
 - d. How do you know?
 - e. Is there any red light reflecting from the black sheet?
 - f. How do you know?
 - g. What color(s) of light must be passing THROUGH your red gel?
 - h. What colors of light must be passing THROUGH your blue gel?
 - i. From where is the red and blue light coming that is reflected from your white paper? (Remember Activity #5-Visible Light?)
4. Copy the diagram on the following page onto your answer sheet and complete the paths of the reflected colors of light from the white paper, through the blue gel and into your eye. Remember: The gel will absorb some colors and others will be transmitted (passed through).



5. How would your diagram in #4 be different if the blue gel was replaced with a red gel?
6. Now print a word using the red crayon on the white, red and black papers. Write a second (different) word right over (on top of) the first on each sheet using the blue crayon. (Don't worry if the resulting text is difficult to read!) Now PREDICT how the specified messages will appear when viewed through the selected gels by filling in the PREDICTION lines of Data Chart #2.
7. Once you've made your predictions, now actually view the words you've written on each paper through the gels and record your findings on the OBSERVATION lines of Data Chart #2.
8. What color of light gets reflected off the blue crayon?
9. What color(s) of light get transmitted through a blue filter?
10. How do you know that blue light get reflected from the white paper?
11. Explain WHY the blue gel produces the blue crayon image that you observed on the white paper.
12. To view a red message written on a white paper, what color gel would you need?
13. To view a red message written on a black paper, what color gel would be needed?
14. Astronomers often use gels when observing photos of celestial objects to allow only certain wavelengths (colors) of light to pass through to their eyes. This process selectively filters out unwanted areas of the image to make it less confusing for analysis. Go to the website <http://antwarp.gsfc.nasa.gov/apod/ap980208.html> on your classroom computer to view an image of the Crab Nebula, a remnant of a supernova explosion that occurred in 1054 A.D. Predict what color gel you would use (red or blue) to allow only the outer edges of the nebula.
15. Now view the image on the computer screen through your selected gel to verify your prediction. Were you correct?
16. Describe the appearance of the same image when viewed through the gel that you DIDN'T choose in # 14 above.